



IN THE U.S. PATENT AND TRADEMARK OFFICE

Appl. No. : 10/576,975  
Applicant : Holger Krummel and Stephan Hartwig  
Filed : 20 April 2006  
Art Unit : 2131  
Examiner : Michael R. Vaughan  
Docket No. : 851.0015.U1(US)  
Customer No. : 29683

Title : A METHOD AND DEVICE RELATING TO SECURITY IN A RADIO  
COMMUNICATIONS NETWORK

Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

DECLARATION UNDER 37 C.F.R. § 1.131

1. I hereby attest that my name is Roland Schink and I have been the Assignee-Nokia Corporation's Senior Patent Engineer responsible for the above-identified patent application at the time the invention report was submitted. In this role I coordinated the patenting of the invention that is the subject of this patent application. I further attest as follows:
2. On 26 May 2003 the underlying invention report was signed by both inventors, Holger Krummel and Stephan Hartwig and submitted to me this same day.
3. In July 2003 prior art searches in the field of the invention were conducted and results discussed with the inventors for considering whether or not the invention report contains patentable subject matter.
4. On 7 August 2003 Nokia Corporation's patent board decided to patent this invention.
5. On 15 September 2003 I instructed our patent attorneys, Swindell & Pearson, Derby, England to draft and file a patent application directed to this invention. (The order letter had a wrong date of 16 September 2003).
6. On 17 October 2003 Swindell & Pearson provided a first draft of the patent application to me and I have forwarded the same to both inventors for review on the same day.
7. On 22 October 2003 a first set of inventor comments pertaining to the patent application draft was sent to Swindell & Pearson.
8. On 7 November 2003 Swindell & Pearson provided a revised draft of the patent application to both inventors for their review.

Appl. No. 10/576,975  
Art Unit 2131  
Appendix to Response

9. On 13, 17, 18 and 19 November 2003 further inventor comments pertaining to the patent application revised draft were sent to Swindell & Pearson.

10. On 20 November 2003, based on the final review and approval of both inventors, the patent application was filed by Swindell & Pearson as International Application Number PCT/IB2003/006378.

11. I hereby acknowledge that the statements made herein are true or are made on information and belief that is believed to be true. I further acknowledge that any willful false statements are punishable by fine or imprisonment, or both, in accordance with 18 U.S.C. § 1001; and that such false statements may jeopardize the validity of any patent that may issue from the application to which this Declaration pertains.

Respectfully Submitted,

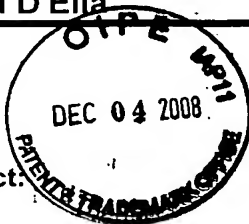
  
\_\_\_\_\_  
Roland Schink

11. NOV. 2008  
Date

David D'Elia

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From: Krummel Holger (NMP-RD/Bochum)  
Sent: Monday, May 26, 2003 2:42 AM  
To: Schink Roland (Nokia/Ratingen)  
Cc: Hartwig Stephan (EXT-Sasken/Bochum)  
Subject: FW: network passkey



Hallo Roland,

anbei ein weiterer Invention Report aus der Bluetooth Ecke.

Die Papierversion schicke ich heute mit der Hauspost los.

Gruesse und Danke,

Holger



Network  
passkey.doc

## INVENTION REPORT

Title of the invention: Network passkey for shared secret based authentication		<b>INVENTION REPORT RECEIVED</b>	
		Code	Patent Engineer/Committee
Please type the description of the invention in this template. If you choose to use an attachment, make sure you answer all the questions in the template.		Place	Date
		Signature of receiver	
Names, employee numbers, job titles and nationalities of all inventors: Holger Krummel Stephan Hartwig	Home addresses of the inventors in respective order:	Business/Technology Units and cost centres:	
Email addresses of the inventors working outside Nokia:			
Office address of the first inventor acting as a contact:			
Phone of the first inventor:		Fax of the first inventor:	
Line manager(s):			
Project: F		Project Manager	
Related product(s):		Related standard(s): Bluetooth	
The invention becomes public on (see section 11 of the invention report):			
I am/ We are the sole/ and original inventor(s) of this invention.			
The company may, by virtue of applicable legislation, be entitled to full or partial rights to the invention. I/ We acknowledge my/our obligation to sign as inventor(s) all documents that may be required for protecting the invention in different countries.			
<b>Applicable to inventions made by inventors employed in FI, DK, DE and SE only.</b>			
Unless the inventor requests the Invention Report to be responded to within four (4) months from the date this Invention Report is received or such other period as the mandatory provisions of the applicable local law may otherwise require, the inventor consents to the right of the employer to use a reasonable period of time for the evaluation of the invention. A reasonable period of time may exceed four (4) months.			
<input type="checkbox"/> I/ We request that the Invention Report be responded to within four (4) months.			
Date:			
Signature(s) of Inventor(s):			

I have read and understood the invention described in this Invention Report

Date:

Signature of Manager or Patent Engineer

1

## DESCRIPTION OF THE INVENTION

**1. Field of technology and background**

*Describe here the technology and the areas of use the invention relates to. Provide here general background knowledge that is required to understand the framework of the invention, and describe the problem to be solved and the invention later.*

Authentication between Bluetooth devices relies on the idea of a shared secret, which is called passkey in Bluetooth terminology. Usually, the passkey is only used as a shared secret for authenticating a pair of devices. This can be extended in an intelligent manner, if several devices establish a connection.

**2. Problem**

*Describe here the problem that the invention solves or the situation that the invention improves, and preferably concentrate on the technical aspects of the problem or the situation.*

If more than two devices want to establish authenticated Bluetooth connections, the "master" of the connection (who is in the center role and therefore administrator of the network) has to agree on a dedicated passkey with all of the "slave" devices (or, more precisely, their owners). The agreed passkeys have to be entered for each of the "slave" devices at both the "slave" device and the "master" device. This is quite cumbersome for the master, especially if the number of people in a network grows.

**3. Prior art**

*Describe here how the problem was solved earlier. Please state also the source of prior art accurately.*

The master agrees with each user verbally on a passkey. The master enters each passkey in order to authenticate with the slaves.

**4. Invention**

*Put here a short crystallization of the invention on a general level including possible use cases.*

All participants agree on a common "network" passkey. This passkey is entered all slaves and the master (only once!).

If a new device joins the network and wants to authenticate with the master, the master will try the network passkey for the authentication with the new device first. If it fails, the master (and the new slave) will prompt the user for a different passkey.

**5. Implementation**

*Describe exemplary implementations in detail with alternatives here, including at least the implementation you consider to be the best. Describe the crucial elements in detail.*

The network passkey is stored in the phone for future usage with all devices, which want to join the network. Additionally, this passkey is communicated verbally to all users in the network.

If two devices cannot authenticate using the network passkey, their owners have to agree on a different passkey.

*I have read and understood the invention described in this Invention Report*

2

Date:

Signature of Manager or Patent Engineer

**7. List of figures**

Write the figure captions here as a list (Figure 1 presents ..., Figure 2 presents ...) and include the images into the invention report (section 5 or section 15) in Word-compatible format (i.e., no embedded images that won't show on the screen when the document is viewed) labelled with the figure number (Figure 1., Figure 2.). Alternatively, include the figures in a separate document (PowerPoint etc.), but make sure to include the description of the figures also here.

**8. List of abbreviations****9. Supervision**

Explain here how we can (if possible) recognise if a competitor is using the same product/feature.

**10. Commercial value**

Evaluate three aspects here: **a)** is the invention planned to be used in a Nokia product (which), **b)** is the invention going to be proposed to a standard (which), and **c)** would Nokia's competitors benefit from the use of the invention (who/how)?

**11. Publication**

If the invention is becoming public in any way, please describe the exact way and details of publication here: what will be disclosed and how. For example, submission of standardization contributions, scientific papers, conference abstracts, theses or papers written for a degree and commercial brochures and offers for sale may be considered as "publication". Also, any use in a product that is publicly available or disclosure (written or oral) to another company without a non-disclosure agreement (NDA) is considered to be a publication.

**12. Dates of the invention**

If you can, put here the date when you first thought of the invention (this date should be verifiable from your personal dated notes). Also, if you have completed the invention, e.g., written a computer program, put this date here (the completion should be verifiable by a witness). Also, provide all evidence material relating to the dates to the patent department.

I have read and understood the invention described in this Invention Report

3

Date:

Signature of Manager or Patent Engineer

16-May-03

**13. Experts**

*If you know any experts that are able to comment the invention, list them here. Also, please mention if you are aware that a certain patent engineer has earlier experience of similar invention reports.*

**14. Further comments**

*Any further comments may be put here, e.g., if you consider the invention to require further development, know of a related earlier invention report in Nokia by you or others, or have any additional information that you think may otherwise affect the decision process.*

**15. The figures**

*Place the figures here, or among the description of the implementation. Alternatively, include the figures in a separate document (PowerPoint etc.).*

*I have read and understood the invention described in this Invention Report*

4

Date:

Signature of Manager or Patent Engineer

**From:** Hartwig Stephan (NMP/Bochum)  
**Sent:** Tuesday, July 29, 2003 2:59 AM  
**To:** Schink Roland (Nokia/Ratingen); Krummel Holger (Nokia-D/Ratingen)  
**Subject:** RE: NC 42728 ; Network passkey and Ericsson patent application

Hi Roland,

our invention describes an application of the below patent application. The application below solves the problem of pairing exactly two Bluetooth devices. If you straightforwardly apply bonding while establishing a piconet of N users, the owner of the Bluetooth Master device would have to type in N-1 passkeys.

Our proposal would require the user to type in the passkey only once, provided that all piconet members agree on the same "network" passkey.

Additional Passkey dialogs will only pop up on the Master's display for those piconet members choosing a passkey different from the network passkey.

Our proposal is accomplished by some simple user interface logic on top of the standard Bluetooth bonding algorithm.

Regards

Stephan

-----Original Message-----

**From:** Schink Roland (NMP-RD/Bochum)  
**Sent:** Monday, July 28, 2003 5:09 PM  
**To:** Hartwig Stephan (NMP/Bochum); Krummel Holger (NMP-RD/Bochum)  
**Subject:** NC 42728 ; Network passkey and Ericsson patent application

Hi Holger and Stephan,

attached a patent application from Ericsson which deals with bonding of Bluetooth devices with a passkey.

Could you please give answers to the following two questions:

1. Does content of the patent application (or the state of the art described in the beginning of the document) correspond to the Bluetooth implementation?
2. Where are the differences between your invention report and this patent application?

BR Roland

**Roland Schink**  
Sr. Patent Engineer  
Nokia GmbH



**David D'Elia**

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**From:** Schink Roland (NMP-RD/Bochum)  
**Sent:** Monday, September 15, 2003 4:49 AM  
**To:** Lechleitner Antje (Nokia/Ratingen)  
**Subject:** NC 42728 - ME board accepted

Hi Antje,

der Invention Report NC 42728 wurde am 7.8.03 vom ME patent board accepted (am Nachmittag vor meinem urlaub).

Ich wollte die Anmeldungsinstruktionen jetzt an S&P schicken und habe eben noch mit Stephan Hartwig über die Anmeldung gesprochen.

Er war überrascht, dass die Sache schon accepted ist. Fehlen inanspruchnahme und Award Ph. 1 in der Sache noch?

Gruss Roland

Roland Schink  
Sr. Patent Engineer  
Nokia GmbH  
Product Creation Site Bochum

**Tracking:**

David D'Elia

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**From:** Schink Roland (NMP-RD/Bochum)  
**Sent:** Monday, September 15, 2003 9:00 AM  
**To:** Patent-Agency Swindell-Pearson (EXT-RES/Southwood)  
**Subject:** NC 42728 - New patent application

Dear Paul,

attached to this email please find instructions for drafting and filing a new patent application, the invention report and some other relevant documents. The invention deals with an improvement in the Bluetooth environment.

Please confirm receipt of this email and attachments and let me know if you can keep the mentioned deadlines, especially draft the application until 17.October 2003.

Kind Regards

Roland

Roland Schink  
Sr. Patent Engineer  
Nokia GmbH  
Product Creation Site Bochum



NC 42728 S\_P  
order letter.doc...



NC 42728 IR  
xtendedNetwork pa.



PAN UI  
Draft\_07.pdf

**NOKIA**

NOKIA GmbH · Postfach 10 18 23 · D-44718 Bochum

Swindell&Pearson  
Attn. Mr. Paul Higgin  
48 Friar Gate, Derby  
DE1 1GY England

Grossbritannien

in advance by Email

Ihre Zeichen/Ihre Nachricht vom

Unsere Zeichen  
Schr/Leca

Telefon-Nr.  
(0234) 984-3670

Fax-Nr.  
(0234) 984-4130

Datum  
16.09.2003

Our code: NC 42728 WO

Order patent application draft and international patent application

Dear Paul,

enclosed please find invention report NC 42728 „Network passkey for shared secret based authentication„. Hereby I instruct you in the name of the Nokia Corporation, Finland, to draft a patent application for the invention as disclosed in the invention report until 17.10.2003. The application shall be filed as an international patent application at the WIPO until 31.10.2003. The examination request for the patent application shall be filed at the Swedish patent office in accordance with general Nokia IPR guidelines. As the applicant Nokia Corporation, Finland, shall be named.

Nokia GmbH  
Meesmannstraße 103  
D-44807 Bochum

Telefon +49-(0)-234-984-0  
Telefax +49-(0)-234-984-3040  
ID/VAT-Nummer DE 811 163 495

Nokia GmbH  
Sitz der Gesellschaft: Bochum  
Amtsgericht Bochum: HRB 4112

Geschäftsführer:  
Stefan Majurin, Sprecher,  
Klaus Goll, Bosco Novák,  
Raine Ohtama, Mads Winblad



The inventors details can be found on the invention report frontpage.  
If you have any further questions do not hesitate to contact us.

Yours sincerely

Roland Schink  
Sr. Patent Engineer  
Nokia GmbH  
Product Creation Site Bochum

Enclosures. - Invention Report NC 42728 (extended with UI spec)  
- WO 02/056536  
- US 5,618,045  
- PAN UI draft

David D'Elia

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**From:** Schink Roland (NMP-RD/Bochum)  
**Sent:** Friday, October 17, 2003 10:58 AM  
**To:** Krummel Holger (Nokia-D/Ratingen); Hartwig Stephan (EXT-Sasken/Bochum)  
**Subject:** FW: Roland Schink; NC42728 - PCT; PH/8608INT; First Draft Patent  
**Attachments:** 8608int.001.doc; 8608int.pdf

Hi Holger und Stephan,

mein ehemaliger Nokia Kollege und jetzt externer patentanwalt Paul Higgin hat mir soeben den Entwurf zu Eurer Network Passkey Patentanmeldung zugeschickt.

Könnt Ihr mir bis nächste Woche Mittwoch 22.10. Eure Kommentare schicken (comments in english are welcome), oder soll ich Euch lieber zu einem Meeting einladen, um den Entwurf zu besprechen?

Gruss Roland

Roland Schink  
Sr. Patent Engineer  
Nokia GmbH  
Product Creation Site Bochum

-----Original Message-----

**From:** Patent-Agency Swindell-Pearson (EXT-RES/Southwood)  
**Sent:** Freitag, 17. Oktober 2003 16:45  
**To:** Schink Roland (NMP-RD/Bochum)  
**Subject:** Roland Schink; NC42728 - PCT; PH/8608INT; First Draft Patent

17th October 2003

Dear Roland,

NC42728 - PCT

First Draft Patent

Our File: PH/GA/8608INT

Please find enclosed a first draft patent application for this invention. I look forward to receiving any comments you or the inventors may have.

Yours sincerely.

SWINDELL & PEARSON

**David D'Elia**

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**From:** Schink Roland (NMP-RD/Bochum)  
**Sent:** Wednesday, October 22, 2003 10:30 AM  
**To:** Patent-Agency Swindell-Pearson (EXT-RES/Southwood)  
**Cc:** Krummel Holger (Nokia-D/Ratingen); Hartwig Stephan (EXT-Sasken/Bochum)  
**Subject:** RE: Roland Schink; NC42728 - PCT; PH/8608INT; First Draft Patent  
**Attachments:** 8608int.001 commented HK\_RS.doc; 42728.ppt

Dear Paul,

today I have discussed the draft of the patent application with inventor Holger Krummel. Comments of inventor Stephan Hartwig, who is on vacation currently, are still missing.

We would like to ask you to consider these comments for the draft of the patent application and submit a revised draft which want to review finally then.

Your sincerely

Roland

-----Original Message-----

**From:** Patent-Agency Swindell-Pearson (EXT-RES/Southwood)  
**Sent:** Friday, October 17, 2003 4:45 PM  
**To:** Schink Roland (NMP-RD/Bochum)  
**Subject:** Roland Schink; NC42728 - PCT; PH/8608INT; First Draft Patent

17th October 2003

Dear Roland,

NC42728 - PCT

First Draft Patent

Our File: PH/GA/8608INT

Please find enclosed a first draft patent application for this invention. I look forward to receiving any comments you or the inventors may have.

Yours sincerely.

SWINDELL & PEARSON

Paul Higgin



David D'Elia

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**From:** Schink Roland (NMP-RD/Bochum)  
**Sent:** Friday, November 07, 2003 7:44 AM  
**To:** Krummel Holger (Nokia-D/Ratingen); Hartwig Stephan (EXT-Sasken/Bochum)  
**Subject:** FW: Roland Schink; NC42728 - PCT; PH/8608INT; Second Draft Patent

Hi Holger and Stephan,

enclosed please find a revised draft for your network passkey invention.

In accordance with Holgers comments Paul inserted "user determined secret" into claim 1 in order to distinguish the claim from fixed passkeys and further inserted Fig. 1B, which shows usage of the invention scatternet.

As I am short of time (on a training next week Monday and Tuesday) I did not have a closer look into the draft, but I am sure, you will do so until next week Wednesday ?

Have a nice weekend

Roland

Roland Schink  
Sr. Patent Engineer  
Nokia GmbH  
Product Creation Site Bochum

-----Original Message-----

**From:** Patent-Agency Swindell-Pearson (EXT-RES/Southwood)  
**Sent:** Friday, November 07, 2003 1:35 PM  
**To:** Schink Roland (NMP-RD/Bochum)  
**Subject:** RE: Roland Schink; NC42728 - PCT; PH/8608INT; Second Draft Patent

Dear Roland,

I am sorry, there was a misunderstanding.

Please find enclosed the revised draft.

I hope you and your family have an enjoyable weekend.

yours sincerely,

Paul

-----Original Message-----

**From:** Schink Roland (NMP-RD/Bochum)  
**Sent:** Fri 07/11/2003 07:47  
**To:** Patent-Agency Swindell-Pearson (EXT-RES/Southwood)  
**Cc:**  
**Subject:** FW: Roland Schink; NC42728 - PCT; PH/8608INT; First Draft Patent

Dear Paul,

have you already been able to revise the draft of this patent application, based on the comments given in the email below?

Maybe there was a misunderstanding, because we did not receive comments from the second inventor so far.

There is no specific urgency for this case but I would appreciate to have it filed by the end of November.

Yours sincerely

Roland

Roland Schink  
Sr. Patent Engineer  
Nokia GmbH  
Product Creation Site Bochum

-----Original Message-----

From: Schink Roland (NMP-RD/Bochum)

Sent: Wednesday, October 22, 2003 4:30 PM

To: Patent-Agency Swindell-Pearson (EXT-RES/Southwood)

Cc: Krummel Holger (NMP-RD/Bochum); Hartwig Stephan (NMP/Bochum)

Subject: RE: Roland Schink; NC42728 - PCT; PH/8608INT; First Draft  
Patent

Dear Paul,

today I have discussed the draft of the patent application with inventor Holger Krummel. Comments of inventor Stephan Hartwig, who is on vacation currently, are still missing.

3. Please find some minor modifications in the attached draft itself.

We would like to ask you to consider these comments for the draft of the patent application and submit a revised draft which want to review finally then.

Your sincerely

Roland

-----Original Message-----

From: Patent-Agency Swindell-Pearson (EXT-RES/Southwood)

Sent: Friday, October 17, 2003 4:45 PM

To: Schink Roland (NMP-RD/Bochum)

Subject: Roland Schink; NC42728 - PCT; PH/8608INT; First Draft Patent

17th October 2003

Dear Roland,

NC42728 - PCT

First Draft Patent

Our File: PH/GA/8608INT

Please find enclosed a first draft patent application for this invention. I look forward to receiving any comments you or the inventors may have.

Yours sincerely.

SWINDELL & PEARSON

Paul Higgin

Tracking:

**David D'Elia**

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**From:** Schink Roland (NMP-RD/Bochum)  
**Sent:** Thursday, November 13, 2003 4:19 AM  
**To:** Patent-Agency Swindell-Pearson (EXT-RES/Southwood)  
**Subject:** FW: RE: NC42728 - PCT; PH/8608INT; Second Draft Patent

Dear Paul,

enclosed please find the reviewed draft for the above case.

After you have revised the draft I would like to ask you to submit it to us for (hopefully) final review.

Yours sincerely

Roland

*Roland Schink  
Sr. Patent Engineer  
Nokia GmbH  
Product Creation Site Bochum*



networkpasskey200  
31111.doc

>

David D'Elia

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**From:** Schink Roland (NMP-RD/Bochum)  
**Sent:** Wednesday, November 19, 2003 6:26 AM  
**To:** Patent-Agency Swindell-Pearson (EXT-RES/Southwood)  
**Cc:** Hartwig Stephan (EXT-Sasken/Bochum); Krummel Holger (Nokia-D/Ratingen)  
**Subject:** RE: NC42728 PCT; (PH/8608int); Revised draft patent appln

Dear Paul,

there are no further comments from my side so the application text is ready for filing now.

Please file an international patent application at the IB and request the search by the Swedish patent office according to the standard Nokia-guidelines.

Yours sincerely

Roland

Roland Schink  
Sr. Patent Engineer  
Nokia GmbH  
Product Creation Site Bochum

-----Original Message-----

**From:** Patent-Agency Swindell-Pearson (EXT-RES/Southwood)  
**Sent:** Wednesday, November 19, 2003 10:30 AM  
**To:** Hartwig Stephan (NMP/Bochum)  
**Cc:** Schink Roland (NMP-RD/Bochum)  
**Subject:** RE: NC42728 PCT; (PH/8608int); Revised draft patent appln

Dear Stephan,

Your comments relate to the method claim only. I believe that these claims will cover the scenario you have described because step 6 clearly falls within the claims.

However, so that there can be no doubt, I have amended the description as enclosed. Please confirm if you are now satisfied with the application.

yours sincerely,  
SWINDELL & PEARSON  
Paul Higgin

-----Original Message-----

**From:** Hartwig Stephan (NMP/Bochum)  
**Sent:** Tue 18/11/2003 10:16  
**To:** Patent-Agency Swindell-Pearson (EXT-RES/Southwood); Schink Roland (NMP-RD/Bochum); Krummel Holger (NMP-RD/Bochum)  
**Cc:**  
**Subject:** RE: NC42728 PCT; (PH/8608int); Revised draft patent appln

Hi,

the text looks much better now. However, I have one concern remaining. Is the following scenario covered by the patent application?

Stephan

> -----Original Message-----  
> From: Patent-Agency Swindell-Pearson (EXT-RES/Southwood)  
> Sent: Monday, November 17, 2003 11:46 AM  
> To: Schink Roland (NMP-RD/Bochum)  
> Cc: Hartwig Stephan (NMP/Bochum)  
> Subject: NC42728 PCT; (PH/8608int); Revised draft patent appln  
>  
>  
> Dear Roland,  
>  
> I spoke with Stephan Hartwig on Friday.  
>

>  
> I look forward to receiving any comments or instructions for filing.  
>  
> yours sincerely,  
> SWINDELL & PEARSON  
> Paul Higgin  
>

Tracking:

**Recipient**

Patent-Agency Swindell-Pearson (EXT-RES/Southwood)

Hartwig Stephan (EXT-Sasken/Bochum)

Krummel Holger (Nokia-D/Ratingen)

**Read**

Read: 11/19/2003 7:36 AM

Read: 11/19/2003 8:41 AM